

ACTION SHEET 17

between

The Department of Energy(DOE)

and

The Power Reactor and Nuclear Fuel Development Corporation of Japan (PNC)

for

Joint Development of Improved Safeguards Methods for Nondestructive Assay Measurements
of Holdup and Scrap Materials

1. Introduction

Under Article I (Objective) of the Agreement between PNC and DOE for Cooperation in Research and Development Concerning Nuclear Material Control and Accounting Measures for Safeguards and Nonproliferation (hereinafter called the "Agreement"), dated September 15, 1993, DOE and PNC undertake to carry out a cooperative effort on improving nondestructive assay (NDA) techniques to measure waste and scrap materials at the PNC Plutonium Production Facility.

2. Scope of work

This Action Sheet (AS) provides for:

- 1) refining operation of the glove-box assay system (GBAS) used for measuring holdup at PFPF (includes improving calibration, refining shielding and techniques for reducing "cross talk" between glove boxes, and studying and reporting estimates of measurement errors),
- 2) evaluating a portable gamma holdup verification system including software for date management and providing a prototype test unit with calibration and training,
- 3) establishing a new calibration and a means of IAEA authentication for the Waste Drum Assay System (WDAS) (includes studying and reporting estimates of measurement errors, and supplying documentation required by the IAEA)
- 4) developing a method using GBAS detector systems to measure large metal boxes containing waste materials (includes improving the design and incorporation reflectors or scanning, relocating the detector systems, calibrating the new systems, studying and reporting estimates of measurement errors),
- 5) assisting in implementation of Plutonium Scrap Multiplicity Counter (PSMC) (includes calibration the systems for measuring holdup being removed from the glove boxes, providing assistance to operate the systems and training in the use of the systems, and calibration for measuring scrap),
- 6) re-examining, studying, and reporting error estimates for other instruments used to measure Pu materials at the PNC,
- 7) providing three plutonium isotopic verification systems (HRGS) including software and training for 200 liter waste drums. Provide PNC with hardware specifications and software consistent with WDAS isotopic input requirements.

Schedules and other information are included in Appendix I.

The work performed under this AS shall be performed at the Los Alamos National Laboratory (LANL) and the Tokai Fuel Plant(TFP) facilities, PFPF, PPFF, and PCDF, in accordance with the terms and conditions of the Agreement.

3. Program Management

LANL is the organization responsible for development of NDA measurement systems. The work to be done is identified in Appendix I and is limited to techniques for safeguards. PNC will participate jointly with LANL in the development of methods and techniques for safeguards. PNC is responsible for providing design information, operating data, and other information required for completion of the systems studies. In addition, PNC should assist LANL in obtaining information about planned inspection activities at PFPF, PPFF, and PCDF from the IAEA.

DOE and LANL shall work directly with PNC in planning tasks and resolving programmatic separate work plans with projected milestones for each task and update the work plans with PNC concurrence as work progresses.

LANL shall prepare brief quarterly progress reports on each task and circulate them to PNC, DOE and to other pertinent organizations as requested by PNC.

LANL and PNC shall prepare and present written and oral reports at meetings of the Permanent Coordination Group(PCG).

4. Fiscal Management

PNC shall make cash contributions with the sum of \$700,000 in United States dollars to conduct the activities related to the completion of work for safeguards at the PFPF, PPFF, and PCDF as defined in Appendix I of this AS in the following manner:

- a. A contribution of \$200,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued upon or shortly after the date of signature of this AS,
- b. A contribution of \$250,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued in April, 1995. This payment is subject to approval and the appropriation of necessary funding by the Japanese Government for Japanese Fiscal year 1995.
- c. A contribution of \$200,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued in April, 1996. This payment is subject to approval and the appropriation of necessary funding by the Japanese Government for Japanese Fiscal year 1997.

- d. A contribution of \$50,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued in April, 1997. This payment is subject to approval and the appropriation of necessary funding by the Japanese Government for Japanese Fiscal year 1997.

All contributions by PNC shall be due and payable within 30 days of receipt by PNC of an invoice from DOE, subject to the availability of appropriated funds to PNC.

DOE shall be responsible for the budget planning and financial management and shall make best efforts to complete the PNC-funded activities in Appendix I satisfactorily and within the cash contributions by PNC. DOE costs are determined in accordance with DOE's policy for costing work it performs for others as set forth in 10 CFR Part 1009. The total cost to PNC for DOE's performance of work under this AS shall not, without PNC's prior consent, exceed the contributions set forth above.

DOE shall not begin or carry out work prior to entry into force of the Agreement and AS and receipt of the required payment in advance; and work shall not be continued after funds from PNC have been depleted. Throughout the duration of work under this AS, PNC shall provide sufficient funds in advance to reimburse DOE for causing LANL to perform the work described in this AS, and DOE shall have no obligation to perform in the absence of adequate advance funds. Payment in advance from PNC shall be sufficient to cover the expected obligation and cash requirements of the work until a subsequent request for payment in advance can be made, collected, and recorded. In this regard, sufficient advance funds shall be provided to maintain, at a minimum, a continuous 90-days advance of funds for expected DOE fund requirements during the life of this AS. Advances shall be sufficient to cover expected termination costs that DOE would incur on behalf of PNC.

5. Duration and Termination

This AS shall enter into force upon the later date of signature, and shall continue in force for three (3) years period, or until mutually agreed by the parties that all activities under this AS are completed.

For the United States Department of
Energy

For the Power Reactor and Nuclear Fuel
Development Corporation of Japan

Name: Kenneth Sanders

Director

Title: International Safeguards Division

Name: T. Yamaguchi

TADATOMO YAMAGUCHI

Title: Director, International Division

Date: 17 Mar. 1995

Date: MAR 03 1995

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APPENDIX I

1. Study Outline

This program involves cooperative effort on improving nondestructive assay (NDA) techniques to measure waste and scrap materials at the PNC Plutonium Production. The program involves several activities as outlined below.

- Activity 1) Refine operation of the glove-box assay system (GBAS) in operation at PFPF. Incorporate methods for improving the calibration and reducing measurement errors. Study methods for adding shielding or using other techniques to reduce "cross talk" between glove boxes. Study and report on estimates of GBAS measurement errors.
- Activity 2) Evaluate a portable gamma holdup verification system including software for date management and provide a prototype test unit with calibration and training .
- Activity 3) Establish an improved calibration for the Waste Drum Assay System (WDAS). Provide a means for IAEA authentication of the WDAS. Study and report on estimates of WDAS measurement errors. Supply documentation required by the IAEA.
- Activity 4) Develop a method for using GBAS detector systems to measure large metal boxes containing waste materials. This includes improving the design and possibly incorporation reflectors or techniques for scanning the metal boxes with the reconfigured GBAS hardware. The effort involves relocating the detector systems, calibrating the new system, and studying and reporting estimates of measurement errors.
- Activity 5) Assist in implementing of Plutonium Scrap Multiplicity Counter (PSMC) obtained from a commercial source. This includes calibrating the system for measuring scrap materials and holdup material being removed from facility components scrap to reduce material unaccounted for (MUF). Provide software to operate the PSMC, and train personnel to use the system.
- Activity 6) Re-examine, study, and report on measurement error estimates for instruments used to measure Pu materials at the PNC.
- Activity 7) Provide three plutonium isotopic verification systems (HRGS) including software and training for 200 liter waste drums. Provide PNC with hardware specifications software consistent with WDAS isotopic input requirements.

2. Site

A. Activities 1-7.

Los Alamos National Laboratory

Los Alamos, New Mexico, USA

and

Power Reactor and Nuclear Fuel Development Corporation

Tokai-mura, Japan

3. Programmatic Responsibilities

A. LANL will be responsible for providing its best efforts within the funding and schedule for Activities 1-7. Technical assistance shall be provided on a non-interference basis with existing programs.

B. PNC will be responsible for facility specific program direction, equipment installation and interface.

As more detailed program plans are development, specific responsibilities will be better defined and delineated.

4. schedule(To be determined)

	<u>Tasks</u>	<u>Calendar Year</u>											
		<u>1995</u>				<u>1996</u>				<u>1997</u>			
		1	2	3	4	1	2	3	4	1	2	3	4
<u>Activity</u>													
1.		x	x	x									
2.		x	x	x	x							x	x
3.		x	x										
4.		x	x	x	x	x							
5.			x	x		x						x	x
6.		x	x	x	x	x	x	x	x				
7.			x	x	x								

The schedule will be followed on a best-effort basis depending on receipt of funding and availability of parts.

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APPENDIX II

Power Reactor and Nuclear Fuel Development Corporation

1. PNC Headquarters

Technical

Tetsuo Otani, General Manager
Safeguards Office
Nuclear Material Control Division
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Development of Energy

1. DOE Headquarters

Technical

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2. Los Alamos National Laboratory

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